Space Weather Forecast

Issued on Wednesday, 03 July 2024 at 01:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Chance of G1/G2 Minor/Moderate storm intervals Days 1 (02 Jul) due to Coronal Mass Ejection (CME) influences.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the last 24 hours with just Common-class flares. There are currently fifteen regions on the disc, the majority of which are small and simple. The region near south-centre disc is currently the largest and most complex one on the disc. A small delta spot recently emerged on its leading part but its trailing part, which consists of multiple small spots, seems to be slowly fading. To the north of this, another region is developing in complexity and size. It did lose its trailing spot but gained a new intermediate spot with penumbra. In the northeast quadrant lies a very elongated but rather small and magnetically simple region. However, it recently showed a proliferation of intermediate spots and remains one of the main players. The region which was responsible for the Moderate-class flare on 01 July has declined.

A large filament (dense arc of plasma) was observed lifting off the sun's surface in the northwest at around 02/1915 UTC. There is no coronagraph imagery available at the time of writing but it is highly likely that a Coronal Mass Ejection (CME) will be observed; we will endeavor to run an analysis as soon as possible. The CME that was observed following the Moderate-class flare on 01 July has been reassessed and is now most considered most likely to miss ahead of Earth's orbit on 05 July. No other Earth-directed CMEs have been observed in imagery during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been those of a slow regime. Solar winds speeds have been slowly declining from 430 to 370 km/s. The Interplanetary Magnetic Field has been weak throughout, with the north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is likely to continue, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: The large CME that was observed leaving the Sun on 29 June may give Earth a glancing blow on Day 1 (03 Jul). A second CME which left the Sun on 01 July has been re-assessed and is now considered to be passing ahead of Earth. There are no significant coronal holes on the disc to give any fast wind influence..

Geomagnetic activity is expected to be generally Quiet to Unsettled (Kp 1-3), with a chance of

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Active to G1/Minor storm (Kp 4-5) intervals and a slight chance of G2/Moderate storm intervals (Kp 6) on Day 1 (under CME's influence), however confidence is fairly low. Returning to mostly Quiet to Unsettled conditions during Days 2 to 4 (04-06 Jul).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, but with a very slight chance of exceeding the S1/Minor Storm threshold should any notable flares occur from the numerous sunspots that currently occupy the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	5	1	1
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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